s18quiz: EXP LOG (SLTN v272)
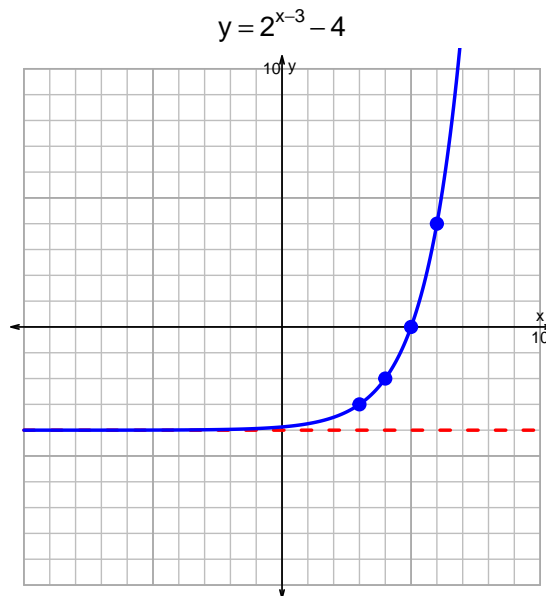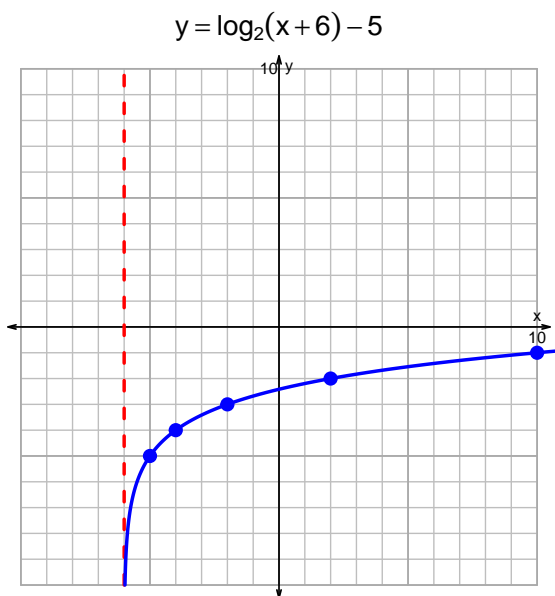
1. Graph $y = \log_2(x + 6) - 5$ and $y = 2^{x-3} - 4$ on the grids below. Also, draw any asymptotes with dotted lines.

$$y = \log_2(x+6) - 5$$

$$y = 2^{x-3} - 4$$

2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$29 = \left(\frac{3}{5}\right) \cdot 10^{-4t/7}$$

Divide both sides by $\frac{3}{5}$.

$$\frac{29 \cdot 5}{3} = 10^{-4t/7}$$

Take log, base 10, of both sides.

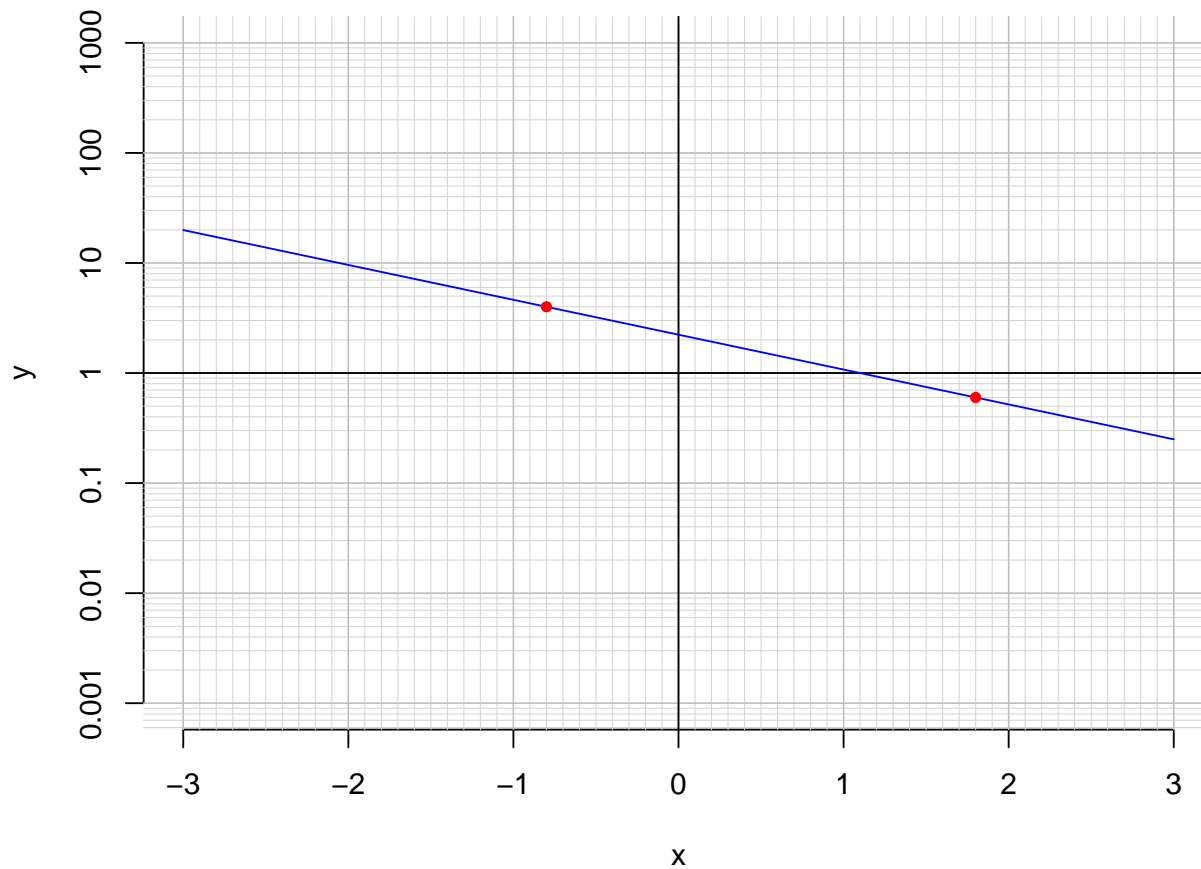$$\log_{10}\left(\frac{29 \cdot 5}{3}\right) = \frac{-4t}{7}$$

Divide both sides by $\frac{-4}{7}$.

$$\frac{-7}{4} \cdot \log_{10}\left(\frac{29 \cdot 5}{3}\right) = t$$

Switch sides.

$$t = \frac{-7}{4} \cdot \log_{10}\left(\frac{29 \cdot 5}{3}\right)$$

3. An exponential function $f(x) = 2.23 \cdot e^{-0.73x}$ is graphed below on a semi-log plot.

a. Using the plot above, evaluate $f(1.8)$.

$$f(1.8) = 0.6$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{-1}{0.73} \cdot \ln\left(\frac{x}{2.23}\right)$$

c. Using the plot above, evaluate $f^{-1}(4)$.

$$f^{-1}(4) = -0.8$$